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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,429	11/20/2003	David Trauernicht	86171WFN	9650

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EXAMINER	
BAKER, DAVID S	

ART UNIT	PAPER NUMBER
2884	

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/718,429	TRAUERNICHT ET AL.	
	Examiner	Art Unit	
	David S. Baker	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/20/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11/20/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/20/03, 06/06/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 1 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hell (US Patent #6,507,032 B1) in view of Jacobsen (US Patent #6,392,341 B2).

Regarding claims 1, 7, and 8, Hell discloses (figure 1, column 4 lines 12-48) a storage phosphor image system comprising a source for producing stimulating radiation directed to a storage phosphor (1) storing a latent image, a means (8,9) for converting radiation to an angular intensity distribution that is substantially narrower than a Lambertian distribution, and a detector (7) for detecting said radiation. Hell does not disclose that the means for converting the radiation is a resonant microcavity converter that also emits a longer wavelength of light after being converted to an angular intensity distribution narrower than a Lambertian distribution. Jacobsen discloses (figure 16, figure 8, column 4 lines 54-67, column 5 lines 1-6, column 6 lines 4-9 and 26-53, column 17 lines 41-53) a resonant microcavity converter (250) that may convert emitted radiation from a storage phosphor to radiation at a longer wavelength than said emitted radiation but with an angular intensity distribution that is substantially narrower than a Lambertian distribution where the converter includes a substrate (252), a bottom dielectric stack (254) reflective to light over a predetermined range of wavelengths and being disposed over the substrate, a top dielectric stack (262) spaced from the bottom dielectric stack and reflect to light over a predetermined range of wavelengths, and an active region that includes one or more periodic gain regions (258) and spacer layers (256, 260) disposed on either side of the periodic gains region and arranged so that the periodic gain region is aligned with the antinodes of the standing wave's electromagnetic field, and that the stimulated emission light (54) is transmitted and introduced into the active region (50) through at least one of the dielectric stack (60). At the time the invention was

made, it would have been obvious to one of ordinary skill in the art to use the resonant microcavity converter of Jacobsen in place of the microlens focusing layer of Hell. The suggestion/motivation for doing so would have been in knowing that the microcavity conversion layer would have the angular intensity conversion properties of the microlens layer but would additionally allow for the conversion of the wavelengths to longer values and therefore higher quantum efficiencies values.

Regarding claims 5 and 6, Hell discloses (figure 1, column 1 lines 37-39 column 3 lines 24-42) that the converter is located in close proximity to and spans the width of a storage phosphor and includes a scanner for scanning a beam of stimulating radiation from a source in a line scan of said phosphor where the stimulating radiation passes through the converter and that the means of conversion is laminated on the phosphor layer and therefore is coextensive in size and located in close proximity to the phosphor layer.

5. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hell (US Patent #6,507,032 B1) and Jacobsen (US Patent #6,392,341 B2) as applied to claim 1 above, and further in view of Livingston (US Patent Application Publication #2003/0132395 A1).

Regarding claims 2 and 3, Hell and Jacobsen do not disclose expressly a light collector located to collect light from the converter and direct it to a detector or wherein the light collector is a light pipe guide. Livingston discloses (figures 1-3, 5, and 7-9, paragraph 0066) a light collector located to collect light from the converter and direct it to a detector and wherein the light collector is a light pipe

guide (22). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a light pipe guide collector to collect light from the converter and direct it to a detector. The suggestion/motivation for doing so would have been the ability to allow for the detector to be placed a distance from the phosphor storage panel as well as to retrieve more emission light than with a single mobile CCD detector.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hell (US Patent #6,507,032 B1), Jacobsen (US Patent #6,392,341 B2), and Livingston (US Patent Application Publication #2003/0132395 A1) as applied to claim 2 above, and further in view of Noguchi (US Patent #4,800,276).

Regarding claim 4, Hell, Jacobsen, and Livingston do not disclose expressly using a cylindrical lens or array of lenses for gathering and redirecting radiation from the microcavity into the light collector. Noguchi discloses (figure 1, column 9 lines 11-25) a cylindrical lens (5) that directs light. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a cylindrical lens to direct the radiation from the microcavity into a light collector. The suggestion/motivation for doing so would have been to allow for more of the emitted light to be collected into the light guide so that better data can be acquired.

7. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hell (US Patent #6,507,032 B1) and Jacobsen (US Patent #6,392,341 B2) as applied to claim 7 above, and further in view of Liao (US Patent Application Publication #2003/0075720 A1).

Regarding claims 9-11, Jacobsen discloses (column 17 lines 41-67, column 18 lines 1-67, column 19 lines 1-28) that the spacer layers are substantially transparent to stimulated emission light and microcavity emission light. Hell and Jacobsen do not disclose expressly wherein one or more periodic gain regions are a combination of an organic host material and a dopant, the host material is aluminum tris(8-hydroxyquinoline), the dopant is [10-(2-benzothiazolyl)-2,3,6,7-te- trahydro-1,1,7,7-tetramethyl-1H,5H,11H-[1]Benzopyrano[6,7,8-ij]quinolizin-- 11-one], the spacer is silicon dioxide, and that the periodic gain region could include polymeric materials. Liao discloses (paragraph 0020, 0023, 0046, 0049, claim 19) that one or more of the periodic gain regions is a combination of an organic host material and a dopant, the host material is aluminum tris(8-hydroxyquinoline), the dopant is [10-(2-benzothiazolyl)-2,3,6,7-te- trahydro-1,1,7,7-tetramethyl-1H,5H,11H-[1]Benzopyrano[6,7,8-ij]quinolizin-- 11-one], the spacer is silicon dioxide, and that the periodic gain region could include polymeric materials. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use an organic host with a dopant for the periodic gain regions with the material discussed above while using polymers for the periodic gains region. The suggestion/motivation for doing so would have been to select an organic material and dopant with the properties desired such as the materials outline above where the periodic gains region is a polymeric material and such that the ionization potentials and energy band gaps are what are needed for a selected emission spectrum.

8. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hell (US Patent #6,507,032 B1) and Jacobsen (US Patent #6,392,341 B2) as applied to claim 1 above, and further in view of Owen (*Progress toward prototype high-definition video-projection CRTs using resonant microcavity phosphor display technology*).

Regarding claims 12 and 13, Hell and Jacobsen disclose all the limitations of claim 1. Hell and Jacobsen do not disclose expressly that the emission from the resonant microcavity converter has an angular intensity distribution with a full-width-at-half-maximum of less than or about +/- 45 degrees or +/- 30 degrees. Owen discloses (figure 2, section 4) a resonant microcavity phosphor with a full-width-at-half-maximum of about +/- 12 degrees. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a resonant microcavity phosphor to create an angular intensity distribution that is substantially narrower than a Lambertian distribution. The suggestion motivation for doing so would have been the knowledge that resonant microcavity phosphors having an angular intensity distribution with a full-width-at-half-maximum of about +/- 12 degrees allows a better collection efficiency.

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